

Ultrastructural features of the nasal mucosa after massive removal of all soft tissues in the inferior turbinate hypertrophy

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The nasal respiratory mucosa plays a key role in conditioning the inhaled air and in regulating the immune response against foreign particles. Many authors recommend mucosal sparing techniques for the surgical management of the inferior turbinate hypertrophy, such as laser surgery, radiofrequency electrocautery, cryosurgery, etc. In spite of their conservative purposes, ultrastructural studies demonstrate that these methods produce irreversible changes in the nasal mucosa. The aim of this study was to analyze ultrastructural features of the healing process after Microdebrider Assisted Turbinoplasty, alternative procedure that provides a radical intervention with removal of both mucosal and submucosal soft tissues of the inferior turbinate. Nasal mucosa biopsies from 7 patients (mean age 42±10) affected with inferior turbinate hypertrophy were taken before operation and 4 months after surgery and compared with 2 unaffected controls of the same age. Preoperative samples, routinely processed for Transmission Electron Microscopy (1), displayed a number of ultrastructural changes compared to normal controls such as disruption of tight junctions, disappearance of pseudostratification, loss of cilia, fibrosis, and abundant inflammatory infiltrates. By contrast, in postoperative samples the nasal mucosa showed a normal appearance, with restoration of the pseudostratified ciliated pattern, intercellular connections and normal cellular morphology; collagen showed a normal organization in bundle and fibrosis and submucosal oedema were considerably reduced. In the light of these observations and previous Scanning Electron Microscopy findings (2), we can conclude that Microdebrider Assisted Turbinoplasty is a surgical procedure able to radically remove the inflamed tissue typical of hypertrophic rhyopathy and, consequently, to allow the resident stem cells to re-epithelize the nasal mucosa and restore its normal function.

References

- [1] Centurione L et al. (2010) Morphometric and ultrastructural analysis of human granulosa cells after gonadotrophin-releasing hormone agonist or antagonist. *Reprod Biomed Online* 20(5):625-33.
- [2] Neri et al. (2013) Respecting nasal mucosa during turbinate surgery: end of the dogma? *Rhinology* 51(4):368-75.

Keywords

Nasal mucosa; ultrastructure; turbinate hypertrophy.